THE ROLE OF FORMAL ANALYSIS FOR IMPROVING MUSICAL SKILLS: A STUDY OF EYE MOVEMENTS

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In music education the area of music theory deals with a wide range of musical phenomena from the specific elements of musical language (melody, harmony, rhythm, tone and dynamics) to the musical structures and musical styles, and even to composition.

Our goal is in this paper is to explore more closely the relationship between the knowledge of certain musical patterns and the ability of playing a musical instrument in college students with the help of eye-tracking analysis.

In recent years a rising number of eye-tracking studies targeted musical skills and also the ability of music-reading. Most of these studies aimed to reveal differences between the sight-reading of expert and non-expert musicians. According to *Waters* et al. (1997) expert musicians develop a more efficient encoding mechanism for identifying the units or patterns of notes, rather than reading the score note by note.

In our research we examined 15 future elementary school teachers' sight-reading abilities during playing the recorder. The musical material was a fragment by *Zoltán Kodály*. The eight-bar, major-pentatonic exercise was composed in the style of Hungarian folksongs. Participants' eye movements were recorded with an eye-tracking system. Data from the 15 taicher trainees were included in eye-movement analyses.

The results suggest that the knowledge of musical patterns strongly influences not only the duration of a musical performance, but the visit counts as well. We divided *Kodály*'s composition into specific research areas, namely into two four-bar half periods and also four two-bar musical motifs. The duration of total fixation times of all participants on the first four bars was longer (586.29 ms.), than on the second four bars (436.52 ms), which have a similar form, metrical structure and melody. Interestingly, the fixation time on the initial time and key signature was low (5.56 ms). The mean number of visit counts on the first half-period of the composition is 8.47 and on the second half-period it is 7.47.

The collected data reveals the significance of the knowledge and understanding of musical structures, and also the knowledge of musical styles. The aim of our further research is to explore gender characteristics and also to find teaching strategies to enhance students' musical skills and understanding. Our further aim is to create online adaptive measurement that could test musical skills in their complexity and that is relevant to the practical needs of modern day music education.